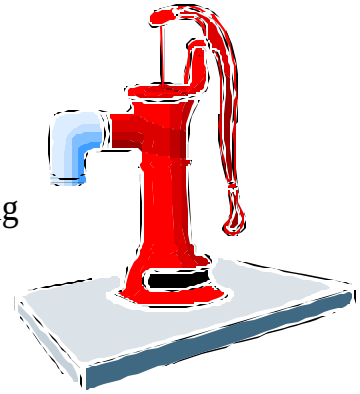
Chapter 1

Overview of Indiana Monitoring, Reporting and Recordkeeping Requirements



Public water systems are required to test their drinking water to see if contaminants that might be harmful to the public health are present. The Federal Safe Drinking Water Act and the Indiana Administrative Code require these monitoring activities for public water supplies.

Nontransient noncommunity water systems may have different contaminants and monitoring schedules. The following monitoring requirements will allow you to become familiar with testing frequencies. For the most part, public water systems should refer to their Standard Monitoring Framework (SMF) or contact the Indiana Department of Environmental Management (IDEM), Drinking Water Branch (DWB).

1.1 Regulated Contaminants, for which monitoring is required

1.1.1 Bacteriological

Public water systems must collect total Coliform samples at sites that are representative of water throughout the distribution system according to a written sample-siting plan approved by IDEM.

Water systems supplied only by ground water, not under the direct influence of surface water, and serving populations of 4,900 persons or less may collect all their monthly samples on a single day, provided the samples are from different locations. It is recommended, however, by the DWB that samples be collected during the first three weeks of the month rather all on one day. All other systems must collect samples at regular time intervals throughout the month.

No more than one sample per month may be Coliform-positive for water systems that collect fewer than 40 Coliform samples per month.

If a routine sample is Total Coliform-positive, the water system must collect a set of repeat samples within 24-hours of being notified of the positive result. A system that collects more than one routine sample per month must collect no fewer than three repeat samples for each total Coliform-positive sample found.

A system that collects one routine sample per month must collect no fewer than four repeat samples for each total Coliform-positive sample found.

The system must collect at least one repeat sample from the sampling tap where the original Total Coliform-positive sample was taken, at least one repeat sample at a tap within five service connections upstream, and at least one repeat sample at a tap within five service connections downstream of the original sampling site. If a fourth sample is required, it may be collected from any location in the distribution system.

If one or more repeat samples in the set is Total Coliform-positive, the water system must collect an additional set of repeat samples as specified in the preceding paragraph. The additional samples should be collected within 24 hours of being notified of the positive result.

The system must repeat this process until either Total Coliforms are not detected in one complete set of repeat samples or the system determines that the Maximum Contaminant Level (MCL) for Total Coliforms has been exceeded and notifies its customers and IDEM.

1.1.2 Nitrates

Base nitrate monitoring for community and nontransient noncommunity public water systems using ground water is required annually. Samples are obtained from the first place water can be drawn after any treatment, or the tap closest to the well if there is not any treatment.

If any result is greater than or equal to 5 mg/l (50% of the MCL for Nitrate), the system must conduct quarterly monitoring. Quarterly monitoring must be continued for at least four consecutive quarters. If results are determined to be "reliably and consistently below" the Nitrate MCL (10 mg/l), the system may be returned to annual monitoring. Future annual samples must then be taken in the quarter that previously yielded the highest result.

For surface water systems, monitoring is required quarterly. The Nitrate monitoring frequency for surface water systems may be reduced to annual if four consecutive quarterly monitoring results for the system are below 5 mg/l. Future annual samples must be taken in the quarter that previously yielded the highest result.

For all systems, if any annual or quarterly Nitrate monitoring result is in excess of 10 mg/l, the system is required to collect a Nitrate confirmation sample. The average of the initial and confirmation sample is used to determine compliance with the MCL. If the average of the initial and confirmation samples is greater than 10 mg/l, the system must conduct quarterly Nitrate monitoring, issue public notification, and pursue remediation of the contamination.

1.1.3 Inorganics

Inorganic Chemicals are substances of mineral origin, and not of basically carbon structure.

Monitoring requirements for Inorganics vary among water supplies. IDEM's Drinking Water Branch will determine your system's monitoring frequency for Inorganics based on established criteria for source water type (surface, ground water or ground water under the direct influence of surface water), and past detections of Inorganics. See list of inorganics in Appendix.

1.1.4 Organics

Organic chemicals are naturally occurring (animal- or plant-produced or synthetic) substances containing mainly carbon, hydrogen, nitrogen, and oxygen. For monitoring purposes, Organic contaminants are considered to be either Volatile Organic Compounds (VOCs) or Synthetic Organic Compounds (SOCs).

1.1.4.1 Volatile Organic Compounds

(VOCs are organic compounds that evaporate easily and react to sunlight in the atmosphere.)

Monitoring requirements for VOCs vary among water supplies. IDEM's Drinking Water Branch will determine your system's monitoring frequency for VOCs based on established criteria for source water type (surface or ground water under the direct influence of surface water), past detections, vulnerability to contaminants, population, and use of contaminants in your area

1.1.4.2 Synthetic Organic Compounds

SOCs are man-made organic chemicals. Some SOCs are volatile; others tend to stay dissolved in water instead of evaporating.

Monitoring requirements for SOCs vary among water supplies. IDEM's Drinking Water Branch will determine your system's monitoring frequency for SOCs based on established criteria for source water type (surface or ground water under the direct influence of surface water), past detections, vulnerability to contaminants, population, and use of contaminants in your area.

IDEM will issue your system a Standardized Monitoring Framework (SMF) indicating the maximum concentrations allowable for Inorganics, Volatile Organic Compounds and Synthetic Organic Compounds. See list of organics in Appendix 2.

1.1.5 Lead and Copper

All nontransient noncommunity water systems must monitor for Lead and Copper. Lead and Copper are sampled in kitchen, bathroom or other cold-water faucet after the water has not been run for at least 6 hours. This allows the water to be in contact with the plumbing long enough for reactions to occur.

Indiana's Lead and Copper Rule requires the water supplier to reduce the corrosivity of its water when lead and/or copper in drinking water meets or exceeds certain "action levels." The Lead Action Level is 0.015 mg/L. The copper action level is 1.3 mg/L.

At least 90% of your samples must be below the action level. The level of lead or copper, if exceeded, triggers treatment or other requirements that a water system must follow.

If either the lead or copper action level is exceeded, contact IDEM's Drinking Water Branch immediately. You will be required to collect samples for water quality parameters (alkalinity, calcium, conductivity, pH, temperature, and orthophosphate and/or silicate, if either or both are added to your system) and for lead and copper in your source water.

You will also need to make a treatment recommendation to IDEM and install treatment equipment and/or process to reduce the corrosivity of the water (its ability to leach metals from plumbing). If you exceed the lead action level, you may be required to replace lead service lines from the main to the customer's property, and you will also need to develop a public education program for your customers.

When the Rule went into effect in December 1992 and 1993 (depending upon water system size), water systems were to collect samples for 2 consecutive six-month monitoring periods (January to June and July to December). Sampling was then reduced to once per year for 3 years, and then to once every 3 years.

1.1.6 Turbidity

Turbidity is a cloudy condition in water due to suspended silt or organic matter. Low levels of turbidity may not be visible to the human eye, but may be easily measured with scientific equipment.

For all public water systems using surface water in whole or ground water under the direct influence of surface water, the maximum contaminant level is 1 Nephelometric Turbidity Unit (NTU). The maximum level may be as high as 5 NTU if the water supplier can demonstrate to IDEM that turbidity does not interfere with disinfection, prevent maintenance of an effective disinfectant agent throughout the distribution system, or interfere with microbiological determinations.

Testing for turbidity should be conducted on a daily basis for the systems described in the above paragraph.

1.1.7 Sodium

While there is no MCL for sodium, water systems are required to monitor for this contaminant.

Surface water systems must test for sodium every year and ground water suppliers must test every three years. We recommend they collect it when they collect their IOCs. IDEM may require more frequent testing. Water suppliers should refer to their Standardized Monitoring Framework for the testing frequency required for their systems.

Test results are reported to IDEM. The supplier of water shall notify the commissioner and local public health officials of the sodium level.

1.2 Records Maintenance

Good records maintenance is an absolute necessity for any well-run water system. Records help form the history of a water works. Maintaining records allows the water system to show compliance with regulations and helps to deal with problems that may be new to you, but have been resolved in the past by others.

IDEM requires bacteriological test records to be kept for at least five years. Radiological and chemical test results should be retained for at least 10 years. Lead & copper records must be maintained for 12 years.

If a system was in violation of any regulation in the past, the system must keep written records of what was done to correct the problem for at least three years. Also, any records of any sanitary surveys performed by the water system or any other party should be kept for a minimum of 10 years.

If IDEM gives you any kind of operating or testing variance, you should request and retain a written copy of the variance authorization for at least five years beyond the last effective date of the variance.

1.2.1 Laboratory Testing

It is important that a "Chain of Custody" be kept for all sampling and testing. This means that months or even years after the sample was taken, a record will show who handled the sample over what periods of time from the beginning to the end of the sampling and testing process.

IDEM-approved laboratories typically have a chain of custody form that is acceptable to IDEM.

Laboratory records (whether performed by water system personnel or an outside laboratory or vendor) should contain the following information:

- Date, place and time of sampling
- Who collected the sample and if a preservative was added
- Reason for the sample (routine or special, raw or finished water, distribution system, plant process, etc.)
- When received or delivered for analysis (date, place and time)
- Who did the analysis, date of analysis and where (field analysis or laboratory name)
- Analysis method and results of the test or tests
- Public Water Supply Identification (PWSID) Number

1.2.2 Valves and Hydrants

A description of every valve and hydrant in a water system should be recorded in a central location where the information can be retrieved if needed. Small water works may use a written valve or hydrant book. Larger systems may choose to use a computer database.

How records are kept is not nearly as important as maintaining a backup or duplicate copy of the records. If the records are lost, stolen or destroyed in a fire or flood, how will perhaps years of work be replaced? Keep copies of important records at another location.

Your records should have the following information:

- Date installed
- Location
- Size, type, equipment manufacture and cost (optional)
- Maintenance history, including flow testing (for hydrants)
- Direction to turn to open or close
- Number of turns to open or close (for valves)
- Unusual characteristics (such as a rising-stem hydrant)
- How to find it if not in an obvious location (like 50 feet north of fence row)

If a system does not have good valve and hydrant records, it is never too late to start a records program. Begin now and start entering information about newly-installed valves and hydrants, and start keeping maintenance and flow records. In a few years you will have accomplished an important task.

Good valve and hydrant records can save countless hours of fieldwork, and are especially important during an emergency or bad weather.

You may wish to contact the American Water Works Association (AWWA) or other similar organizations for more information on valve and hydrant record keeping.

1.2.3 Distribution System Maps

Distribution System Maps allow the water system to be seen at a glance. The maps should show all your lines (excluding small customer service connections), storage tanks, valves and hydrants (including flush hydrants). The sizes of the lines should be noted, as well as the type of lines (ductile or cast iron, PVC, etc.) The locations of the lines should be referenced to street names, rights-of-way, permanent landmarks, etc.

It is important to understand the distinction between contract plans or documents and "as-built" maps (also called "record drawings"). As-builts show what was really installed and at what actual location as compared to the original design.

Almost all construction projects are completed somewhat differently than was originally planed due to unanticipated field problems and/or changes after the project plans were first drawn.

Be sure that system maps accurately show what was actually installed. If you find that your current maps are different than what is in the ground, be sure to update them.

It is a good idea to have copies of your system maps. This allows you to make field notes on the copies to make map updating easier. Having extra copies of the maps also makes it easier for the people who need them to get them during an emergency.

1.2.4 Maintenance Logs

Almost every piece of equipment in a water system needs to be maintained. It is important to keep maintenance logs for all equipment, including the replacement of a part or whole item.

The needs for maintenance include extending the life of equipment, lowering the operating costs and scheduling repairs or replacements at times convenient to the operator. Good maintenance helps make a system more reliable during periods of high water demand.

Maintenance logs can provide records that show required maintenance activities have been performed. This can be useful in resolving warranty claims. These same records can help you in budgeting especially if you allocate funds between different operating divisions such as treatment plant, distribution system, etc.

Even the smallest system can benefit from maintenance logs. These records can be used to help predict when equipment may fail. For example, if your log shows that a seal in a pump is needing replacement more and more frequently, you will know that it is probably in need of rebuilding or replacement. You can then schedule the maintenance rather than dealing with an unexpected outage.

1.2.5 Manuals

Manuals are necessary for the operation of water systems. They will help you operate and maintain equipment and assist you in obtaining replacement parts.

A manual for the installation, operation and maintenance of equipment should be supplied to you whenever a new piece of equipment is installed or sold to you. Many manuals include a parts list, suggested spare parts inventory and distributor and repair contractor contacts.

If the equipment is complex and was installed by a contractor, a drawing of the installation should be made available to you. Be sure that the drawing is an "as-built" or "record drawing," that depicts what was actually installed (as opposed to what was specified).

Manuals should be kept in a location where people who may need them can reference them. It is a good idea to make copies of all or parts of manuals that are needed in the field to prevent loss of or damage to the originals, which may be hard to replace.

If manuals are missing that might be needed in the future, consider contacting the manufacturer or sales representative for replacements before the manual is needed. This can often be accomplished at little or no cost.